DOCUMENT RESUME

ED 149 275 CS 003 838

AUTHOR Erendine, Lois
TITLE An Investigation of Readiness Test Results with Kindergarten Children Using Object-Form and Paper-Pencil Methods.
PUB DATE Feb 76
NOTE 13p.; Paper presented at the Annual Meeting of the International Reading Association Southwestern Regional Conference (6th, Oklahoma City, Oklahoma, Feb. 26-28, 1976) ; Tables in this document may not reproduce clearly

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Comparative Analysis; *Dimensional Preference; Kindergarten; *Performance Factors; Primary Education; *Reading Readiness Tests; *Reading Research; Socioeconomic Status; Testing; *Visual Perception

ABSTRACT

This study examined the effects of using either object-form or paper/pencil versions of reading-readiness tests on the test scores of kindergarten children from low, middle, and high socioeconomic strata. Of 453 kindergarten students that were classified into the three socioeconomic strata, 35 boys and 35 girls were randomly selected from each strata group. These 210 subjects were tested for reading readiness by using either the object-form or the paper/pencil version of the Lee-Clark Reading Readiness Test (1962 version). The object forms of each test item were made to scale, reflecting the appearance of the paper/pencil test by placing letters and figures on white masonite sheets. Test results indicate that the object-form version had a facilitating effect on the performance of all students in the study; the males in upper and lower socioeconomic groups benefitted most. Four recommendations are offered for further testing in this area. (RL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

BEST COPY AVAILABLE

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED149275

"An Investigation of Readiness Test Results With Kindergarten Children Using Object-Form and Paper-Pencil Methods"

Lois Exendine

Readiness tests help to identify reading readiness and related capacities in kindergarten pupils and entering first-grade pupils. Providing the proper educational program for each pupil is a difficult but desirable goal, and as such becomes a major school responsibility. Scores from tests provide several kinds of necessary data required for sound program planning. This study attempted to assess the level of individual pupil prereading ability using object-forms and paper-pencil tests to conclude whether some readers are limited in answering questions on tests when it is the state of presentation rather than the existing knowledge of the correct answer.

The purpose of using the two methods was to determine if students perceived items better and received a higher score on tests when using object-forms rather than the usual paper-pencil technique of testing in classrooms. This study investigated an assumption that paper-pencil tests are adequate, an assumption that has rarely been challenged.

The problem was to determine if there were significant mean differences and significant correlations among the raw scores of kindergarten students from different socioeconomic levels and sexes on the Lee-Clark Reading Readiness Test (1962 Revision) and an object-form of the identical test material items.

Design of the Study

Kindergarten students were classified into three socioeconomic strata groups by using Hollingshead's Two Factor Index of Social Positon and randomly

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Lois Exendine
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND THE ERIC SYSTEM CONTRACTORS."

CS003838

selected for participation in the study. Four hundred fifty-three students were tested with a total of two hundred ten (N=210) students participating in the research study. Thirty-five boys (N=35) and thirty-five girls (N=35) were randomly selected in each of the lower, middle and upper socioeconomic strata groups. The Lee-Clark Reading Readiness Test was presented in object-form and paper-pencil form alternately to the various groups by trained test administrators. Thirty hypotheses were tested using the data collected from the four subtests and total raw scores.

The Lee-Clark Reading Readiness Test (1962 Revision) was chosen to determine the participants' readiness scores. The four subtests are (1) Matching Letter Symbols, (2) Crossing Out Letter Symbols, (3) Vocabulary and Following Instructions Concepts, and (4) Identification of Letters and Words Symbols. The test-retest reliability of the Lee-Clark Reading Readiness Test ranges from .83 to .94 on the subtests, with a correlation of .92 for the whole test. The validity of the test has been measured against a criterion of success at the end of the first year.

Object forms of each test item were made to scale of the eight-page readiness test. The letters and figures were placed on sheets of masonite painted white. In order that the testing could be completed within ten days, five sets of the test materials were constructed.

Five testers were trained to administer and score the object-form and paper-pencil tests. The timing for administration of the test was closely adhered to during the period of administration.

The statistical analysis was performed on the raw scores taken from the subtests and total scores on the paper-pencil and object-form of the Lee-Clark Reading Readiness Test (1962 Revision). The first step in the data analysis

procedure was to compute the descriptive statistics for the male and female groups in their respective socioeconomic stratum.

The .05 level of significance was adopted for rejection of the null hypothesis. The students t test, a z test, and a Pearson's Product-Moment Correlation was used to test the thirty null hypotheses which were stated before collection of the data. The F value was calculated by using Fisher and Yates statistical tables for calculating formulas.

Data analysis began by grouping the students' scores on the two forms of the Lee-Clark Reading Readiness Test according to sex by socioeconomic level. A mean difference (gain or loss score) measure was computed for each student when the Lee-Clark Reading Readiness Test scores were subtracted from the object-form raw scores. The data analysis consisted of computing the descriptive statistics on each set of data such as the mean ($\bar{X}$), standard deviation (S) and variance (S^2).

Analysis of the data when testing the hypotheses required the use of the following statistical tests: (1) the student's t test both for correlated data and independent data, (2) the Pearson's Product-Moment correlation coefficient for determining the relationships among the Lee-Clark Reading Readiness Test and object-form raw scores of the various groups, and (3) the z test for comparing the Lee-Clark Reading Readiness Test object-form correlation coefficients of the various socioeconomic groups whenever inter-group comparisons were made.

The first general hypothesis was stated as:

Ho_1 There are no statistically significant mean differences among the respective groups on each of the four subtests and total raw scores on the Lee-Clark Reading Readiness Test and an object-form of the same test among three socioeconomic status groups by sex.

The second general hypothesis was stated as:

Ho_2 There are no statistically significant correlations among the respective groups on each of the four subtests and total raw scores on the Lee-Clark Reading Readiness Test and an object-form of the test among three socioeconomic status groups by sex.

Results of Data Analysis

The results indicate that nearly all sex groups at each socioeconomic level performed better on the object-form version of the Lee-Clark Reading Readiness Test material than on the paper-pencil version. The *t* values computed for each comparison are presented collectively in the following table as a means of summarizing the results obtained in testing the fifteen sub-hypotheses of Hypothesis Ho_1.

The significant *t* values presented in Table 1 show definite patterns along both socioeconomic and sex dimensions. It was obvious that differences between the paper-pencil and object-form scores were consistently different on some subtests, while other subtests show less of a difference. The results may best be summarized by socioeconomic level, sex, and total groups.

The results between the paper-pencil and object-form tests on the various subtest scores of socioeconomic groups were as follows: (1) Subtest I--significant differences existed for all three socioeconomic groups; (2) Subtest II--significant differences existed only for the males in the lower socioeconomic group (3.452), no significant differences in the other groups for this subtest; (3) Subtest III--significant differences existed in the lower socioeconomic male group (5.122) and in the upper male (3.132) and female (2.561). There were no significant differences in the remaining socioeconomic groups for this subtest. (4) Subtest IV--significant differences existed in the lower socioeconomic group males (3.989), females (2.639), and for the males in the upper socioeconomic group (2.117).

TABLE 1

SUMMARY OF STATISTICAL RESULTS OBTAINED FROM TESTING THE FIFTEEN SUBHYPOTHESES OF HYPOTHESIS NO. 1

Groups	Readiness Subtests and Corresponding t-Values				
	Subtotal I	Subtotal II	Subtotal III	Subtotal IV	Total
Upper Class					
Males	3.084*	1.493	3.132*	2.117*	2.902*
Females	2.830*	1.855	2.561*	0.000	3.222*
Middle Class					
Males	2.500*	1.841	1.530	1.508	3.142*
Females	2.464*	1.388	0.826	1.828	2.949*
Lower Class					
Males	2.931*	3.452*	5.122*	3.989*	5.230*
Females	3.807*	1.646	1.774	2.639*	4.424*
Total Upper Cl.	4.200*	2.088*	4.065*	1.746	3.796*
Total Middle Cl.	3.529*	2.318*	1.655	2.245*	4.327*
Total Lower Cl.	4.800*	3.706*	4.456*	4.690*	6.855*
Total Males	4.954*	3.434*	1.093	0.637	6.207*
Total Females	5.285*	2.745*	2.940*	2.713*	6.047*
Total Students	7.278*	4.293*	5.883*	5.055*	8.454*
Upper vs Middle	-0.271	-0.061	-1.861	0.282	-0.400
Upper vs Lower	0.853	-0.071	0.139*	1.662	1.662
Middle vs. Lower	1.083	0.000	2.054*	2.047*	2.215*

*Significant beyond the .05 level

Significant differences existed in all socioeconomic groups in the total score.

A summary of the comparisons made between the paper-pencil total raw scores and the object-form raw scores recorded for socioeconomic groups showed that the greatest improvement resulting from the object-form presentations was experienced by the lower socioeconomic group (4.27 total points increase), the second highest increase in the upper socioeconomic group (2.70 total points), and the least increase in the middle socioeconomic group (1.84 total points). It should be noted, however, that the amount of increase experienced by all three socioeconomic groups was significant. Also, the overall increase experienced by the male participants (3.42 total points) was higher than the increase experienced by the female participants (2.45 total points). These results indicate that the object-form version of the Lee-Clark Reading Readiness Test had a facilitating effect upon the performance of all the students in this study. The males in upper and lower socioeconomic groups appeared to benefit the most of all the groups being tested. Also, a summary of the comparisons between the paper-pencil and object-form tests for the upper, middle, and lower classes showed for individual Subtests I, II, III, IV, and total raw scores significant differences existed in all cases with the exception of the total middle class in Subtest III (1.655).

A summary of the comparisons between the paper-pencil and object-form tests for total males, females, and students showed for Subtests I, II, III, IV and total scores that significant differences existed in all cases with the exception of the total males in Subtest III (1.093) and Subtest IV (0.637).

The comparisons between the paper-pencil and object-form tests between the upper vs middle, upper vs lower, and middle vs lower for Subtests I, II, III, IV, and total scores, that no significant differences existed with the exception of that between the middle vs lower in Subtest III (2.054), IV (2.047), and total score (2.215) and between the upper vs lower in Subtest IV (2.265).

In summary, these results indicate that the object-form version of the Lee-Clark Reading Readiness Test had more of an effect (result) upon the performance of all the students used in this study. However, less differences seemed to exist in the middle class, particularly in Subtests II, III, and IV. Also, the results indicate that the females experienced less of a significant difference between the paper-pencil and object-form test than the males. The results are further explored in testing the second general hypothesis, and the conclusions drawn from all findings.

The correlation values ("r") (Table 2) show a definite pattern of significance. It should be further noted, however, that these patterns did not adhere to socioeconomic categories. For example, there were significant correlations between the paper-pencil and object-form Subtest II, III, IV, and total raw scores with the exception of males in the upper socioeconomic status level where no significant correlation existed. Also, there were no significant correlations between the paper-pencil and object-form raw scores of all three socioeconomic levels for Subtest I.

A comparison of the overall correlation coefficients computed for the three socioeconomic groups was made to determine if the paper-pencil/object-form correlations computed for each socioeconomic group were significantly different (Table 3). The correlation computed between the middle socioeconomic

TABLE 2

PAPER-PENCIL AND OBJECT-FORM CORRELATION COEFFICIENTS FOR STUDENTS FROM THREE SOCIOECONOMIC STATUS LEVELS ON LEE-CLARK READING READINESS TEST

Groups	Subtests and Corresponding Correlations ("r")				
	Subtotal I	Subtotal II	Subtotal III	Subtotal IV	Total
Upper Class					
Males	.314	.277	.347*	.328*	.390*
Females	-.172	.353*	.562*	.387*	.675*
Middle Class					
Males	.248	.819*	.466*	.584*	.713*
Females	.106	.656*	.398*	.706*	.721*
Lower Class					
Males	.248	.760*	.663*	.478*	.631*
Females	.080	.421*	.348*	.411*	.388*
Total Upper Cl.	.123	.308*	.454*	.295*	.414*
Total Middle Cl.	.175	.780*	.430*	.623*	.714*
Total Lower Cl.	.161	.703*	.512*	.448*	.536*
Total Males	.269*	.616*	.506*	.507*	.576*
Total Females	.038	.456*	.482*	.496*	.607*
Total Students	.153	.595*	.482*	.490*	.571*

*Significant beyond the .05 level

Table 3

A COMPARISON OF THE CORRELATIONS BETWEEN PAPER-PENCIL AND OBJECT-FORM RAW SCORES OBTAINED BY MALES, FEMALES, AND TOTAL POPULATION OF STUDENTS ON FOUR SUBTESTS AND TOTAL OF LEE-CLARK READING READINESS TEST

Lee-Clark Reading Readiness Test Sub-Areas	Total Males (N=105)					Total Females (N=105)					Total Students (N=210)				
	Paper-pencil Scores		Object-form Scores			Paper-pencil Scores		Object-form Scores			Paper-pencil Scores		Object-form Scores		
	Mean	Standard Deviation	Mean	Standard Deviation	Correlation Coefficient	Mean	Standard Deviation	Mean	Standard Deviation	Correlation Coefficient	Mean	Standard Deviation	Mean	Standard Deviation	Correlation Coefficient
Subtest I--Matching letter symbols	10.47	2.36	11.57	0.76	.269*	10.28	2.11	11.44	0.88	.038	10.37	2.24	11.51	0.82	.153
Subtest II--Crossing out letter symbols	11.22	1.91	11.74	0.73	.616*	11.68	0.96	11.91	0.33	.456*	11.45	1.53	11.82	0.57	.595*
Subtest III--Vocabulary and following instructions	18.35	1.32	18.99	1.06	.508*	18.25	1.24	18.60	1.17	.482*	18.30	1.28	18.80	1.13	.492*
Subtest IV--Identification of letters and word symbols	16.11	4.07	17.59	2.25	.507*	16.62	3.03	17.33	2.18	.496*	16.36	3.58	17.46	2.21	.490*
Total Score	56.13	7.49	59.89	3.37	.576*	56.82	5.24	59.28	3.19	.607*	56.48	6.45	59.57	3.29	.572*

*Significant beyond the .05 level

group's paper-pencil/object-form raw scores (r=0.714) was significantly higher than the correlation computed for either upper socioeconomic group (4=0.414) or for the lower socioeconomic group (r=0.536) on the same raw scores, although all socioeconomic groups' correlations were significant.

A comparison of the overall correlation coefficient computed for males, females, and total population of students was made to determine if the paper-pencil/object-form correlations computed were significantly different (Table 4). The correlations computed showed that the females (r=0.607) was higher than those computed for the males (r=0.576) was higher than those computed for the males (r=0.576), although both sets of correlations were significant.

The data contained in Table 3 further shows less variability by sex and total students for the object-form test than for the paper-pencil test. While the total test results range from 56.13 to 56.82 with standard deviations ranging from 5.24 to 7.49 on the paper pencil test, the respective ranges for the object-form test are 59.28 to 59.89 and 3.19 to 3.37. With the exception of Subtest III, the range of the mean values by sex and total students is less for the object-form test than for the paper-pencil test.

Because of the narrow range and little variation this could account for the low correlations for Subtest I. On the other hand, all other correlations between the two forms of the subtests yielded significant correlations which indicates high reliability.

Recommendations

Similar studies should be conducted which would yield additional information and expand the amount of knowledge yielded in this and similar

Table 4

A COMPARISON OF THE PAPER-PENCIL AND OBJECT-FORM CORRELATION COEFFICIENTS COMPUTED FOR STUDENTS FROM THREE SOCIOECONOMIC STATUS LEVELS ON FOUR SUBTESTS AND TOTAL OF LEE-CLARK READING READINESS TEST

Lee-Clark Reading Readiness Test Sub-Areas	Upper vs Middle (N=70)					Upper vs Lower (N=70)					Middle vs Lower (N=70)				
	Upper Correlations		Middle Correlations			Upper Correlations		Lower Correlations			Middle Correlations		Lower Correlations		
	Correlation	Fishers Z	Correlation	Fishers Z	Z-Value	Correlation	Fishers Z	Correlation	Fishers Z	Z-Value	Correlation	Fishers Z	Correlation	Fishers Z	Z-Value
Subtest I--Matching letter symbols	.123	0.124	.175	0.187	0.365	.123	0.124	.161	0.162	0.220	.175	0.187	.161	0.162	-0.087
Subtest II--Crossing out letter symbols	.308	0.318	.780	1.040	4.178*	.308	0.318	.703	0.873	3.212*	.780	1.040	.703	0.873	-0.967
Subtest III--Vocabulary and following instructions	.454	0.490	.430	0.459	-0.179	.454	0.490	.512	0.565	0.434	.430	0.459	.512	0.565	0.614
Subtest IV--Identification of letters and word symbols	.295	0.314	.623	0.731	2.414*	.295	0.314	.448	0.482	0.972	.623	0.731	.448	0.482	-1.441
Total Score	.414	0.440	.714	0.996	3.218*	.414	0.440	.536	0.599	0.920	.714	0.996	.536	0.599	2.298*

*Significant beyond the .05 level

studies. Other findings would benefit further this particular research effort. Specifically, the recommendations are as follows:

1. Conduct a study of only the upper and lower socioeconomic levels to further support the results indicated in this study of the socioeconomic differences.

2. Conduct a study of all three socioeconomic levels but performed on a culturally-oriented race.

3. Conduct a study of all three socioeconomic levels but performed on a rural-community facility.

4. Conduct a study where I.Q. scores rather than socioeconomic status levels is the variable for establishing levels for testing.

Lois Exendine, Ed.D.
Associate Professor of
Education and Psychology
Oklahoma Christian College